UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,817	12/27/2001	Gary A. Coen	BOEI-1-1038	6942

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BLACK LOWE & GRAHAM, PLLC
701 FIFTH AVENUE
SUITE 4800
SEATTLE, WA 98104

EXAMINER
FERNANDES, CHERYL M

ART UNIT	PAPER NUMBER
2171	

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

> A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
> THE MAILING DATE OF THIS COMMUNICATION.
> - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
>   after SIX (6) MONTHS from the mailing date of this communication.
> - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
> - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
> - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
>   Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
>   earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>*19 March 2002*</u>.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>*1-28*</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>*1-28*</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>*27 December 2001*</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1.   Claims 2, 3, 16, and 17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a 'green light icon' that is displayed if a node is acyclic and stable (see para. 74 of the instant specification), does not reasonably provide enablement for a valid type dependency. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3.   Referring to claims 1 and 15, the claims recite the limitation "the terms associated with other lexical nodes" in lines 8 and 2-3 respectively. There is insufficient antecedent basis for these limitations in the claims.

4.   Referring to claims 2, 3, 16, and 17, the claims recite the limitation "a valid

type dependency", however it is unclear as to how a valid type dependency is

ascertained. In the interest of compact prosecution, Examiner will assume that a

valid type dependency is ascertained when a node is acyclic and stable as

indicated by a green light symbol (see para. 74 of the instant specification).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors

Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology

Technical Amendments Act of 2002 do not apply when the reference is a U.S.

patent resulting directly or indirectly from an international application filed before

November 29, 2000. Therefore, the prior art date of the reference is determined

under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C.

102(e)).

5.   Claims 1-3, 13-17, 27, and 28 are rejected under 35 U.S.C. 102(e) as

being anticipated by US Patent Number 6,446,081 B1 issued to Preston.

6.   Referring to claims 1 and 15, Preston discloses:

A computer method and system for viewing a data dictionary structure

(Abstract), the system comprising a processor (Abstract) comprising:

- a first component configured to retrieve a data   dictionary

  ('stored lexical table', col. 2, lines 57-61; 'lexical database', col.

  10, lines 20-24, Fig. 9a, element 234; access of lexical

  database, Fig. 15b, element 724) including terms ('dictionary

  entries', col. 3, lines 5-14; 'object', col. 7, lines 1-7; col. 7, lines

  21-24, Fig. 7, elements 510, 520) and term definitions

  ('meaning', col. 3, lines 5-14; 'meaning' field, col. 7, lines 21-25;

  Fig. 7, elements 514, 524);

- a second component configured to determine all lexical nodes

  of the data dictionary based on the terms (col. 8, lines 27-43;

  locate objects of lexical database, Fig. 15b, element 726);

- a third component configured to parse each term's definition

  (Abstract; col. 8, lines 44-47; Fig. 8, element 610);

- a fourth component configured to determine dependencies of

  each lexical node based on the parsed definitions and the terms

  associated with the other lexical nodes ('pointer data' indicates

  semantic dependencies, col. 7, lines 1-10; 'pointer fields'[1], col.

  7, lines 21-32, 'linked from', 'linked to', Fig. 7, elements 518,

  519, 528, 529; col. 9, lines 27-37; Fig. 14, elements 662, 664);

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[1] The interconnection between objects is derived by the pointer fields thereby allowing the determination of dependencies of each lexical node.

- a fifth component configured to generate a lexical graph (Fig.

11a-b) based on the determined lexical nodes and the

determined dependencies (Abstract; 'display control data'

generated, col. 7, lines 1-10); and

- a display coupled to the processor and configured to display at least a portion of

the generated lexical graph (Abstract; col. 1, lines 63-67; col. 7, lines 31-50, Fig.

5b; col. 9, lines 37-42; col. 10, lines 36-51 and 58-64, Fig. 11a-b; col. 10, line 65-

col. 11, line 3, Fig. 13; 'semantic dictionary', Fig. 24b).

7.   Referring to claims 2 and 16, Preston discloses that the determined

dependencies comprise at least one of a valid type dependency, a caution type

dependency, or a cyclical type dependency (col. 18, lines 44-52)[2].

8.   Referring to claims 3 and 17, Preston discloses generating node icons

based on the dependency type ('codes' indicating the level of difficulty,

complexity or obscurity of each entry in the lexical table, col. 11, lines 31-40)[3].

9.   Referring to claims 13 and 27, Preston discloses modifying at least one

definition associated with the terms of one or more lexical nodes, parsing the

at least one modified definition, redetermining dependencies of each lexical

node based on the previous parsed definition, parsed modified definition,

and the terms associated with the other lexical nodes, and regenerating the

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[2] In this citation Preston discloses a cyclical dependency (as defined in para. 21 of the instant
specification) where a determination of a sequence is made wherein event A is expected to cause
event B but B is expected to cause A.
[3] Referring to para. 21 of the instant specification, an icon is defined as a status symbol.
Examiner respectfully asserts that a code for each entry in the lexical table is a status symbol.

lexical graph based on the redetermined dependencies (col. 8, line 44- col. 9, line

7; col. 10, line 65 – col. 11, line 19; col. 16, lines 20-30).

10.   Referring to claims 14 and 28, Preston discloses adding a lexical node by

inserting a term and term definition; parsing the term definition of the added

lexical node; redetermining dependencies based on the previous parsed

definitions, the parsed definition of the added lexical node, and the terms

associated with the other lexical nodes; and regenerating the lexical graph

based on the redetermined dependencies (col. 8, line 44- col. 9, line 7; col. 10,

line 65 – col. 11, line 19; col. 16, lines 20-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

11.   Claims 4-7 and 18-21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Preston as applied to claims 1and 15 above, in view of '*A*

dynamic cluster maintenance system for information retrieval' by Can et al.

(hereafter Can).

12.   Referring to claims 4 and 18, Preston discloses all of the claimed subject

matter as set forth above but fails to disclose:

- determining a lexical stability value for each lexical node (claims 4 and 18);

- displaying the determined lexical stability value with the associated lexical node in a lexical graph (claims 5 and 19);

- determining that the lexical stability value comprises dividing the number of nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the number of nodes that the current node lexically depends from (claims 6 and 20); and

- determining an aggregate stability value (claims 7 and 21).

However, referring to claims 4-7 and 18-21, Can teaches analogous art wherein the following is taught:

- determining a lexical stability value for each lexical node (Abstract; pages 123-130)[4] (claims 4 and 18);

- displaying the determined lexical stability value with the associated lexical node in a lexical graph (Fig. 1, 2, and 3) (claims 5 and 19);

- determining that the lexical stability value comprises dividing the number of nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the

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[4] A lexical stability value is determined for each document, m, in an index vocabulary database by a 'CC Based Cluster Maintenance' algorithm in order to assess stability or similarity characteristics of documents within the database.

number of nodes that the current node lexically depends from ('centroid entry', page 129, part 4.5 (b)) (claims 6 and 20); and

- determining an aggregate stability value (Abstract; page 127, Section 4.3 till part (e)) (claims 7 and 21).

It would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify Preston to further include determining and displaying a lexical stability value for each lexical node, furthermore determining that the lexical stability value comprises dividing the number of nodes that lexically depend on a current node by the number of nodes that lexically depend on the current node plus the number of nodes that the current node lexically depends from, and determining an aggregate stability value as taught by Can.

The ordinary skilled artisan would have been motivated to modify Preston per the above for the purpose of judging the effectiveness of a cluster maintenance scheme, that is, for the purpose of enabling new additions to be made into a cluster, while not causing noticeable changes to be made in the original cluster. Additional motivation includes the ability of the clustering strategy of Can to handle dynamic cluster maintenance efficiently and effectively (see page 126, Section 4; Conclusion, Section 5).

13.   Claims 8-12, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Preston in view of Can as applied to claims 4, 7, 18, and 21

above, and further in view of US Patent Number 6,263, 334 B1 issued to Fayyad

et al (hereafter Fayyad).

14.   Referring to claims 8-12, and 22-26, Preston/Can discloses all of the

claimed subject matter as set forth above, however the combination of

Preston/Can fails to disclose:

- displaying an aggregate stability value (claims 8 and 22);

- determining that the aggregate stability value of a current node

  comprises adding the lexical stability values of all nodes that are

  lexically dependent upon the current node to the current node's lexical

  stability value (claims 9 and 23);

- determining a global stability value by summing lexical stability values

  of all nodes (claims 10 and 24);

- determining a fractional stability value for each node based on the

  aggregate and global stability values (claims 10 and 24);

- displaying the determined fractional stability value for each node

  (claims 11 and 25); and

- determining that the fractional stability for a current node comprises

  dividing the current node's aggregate stability value by the global

  stability value (claims 12 and 26).

However, referring to claims 8-12, and 22-26, Fayyad teaches analogous

art wherein the following is taught:

- displaying aggregate stability values (or probability density values, *h1* and *h2*) (col. 6, lines 10-27; Fig. 5) (claims 8 and 22);

- determining that the aggregate stability value of a current node comprises adding the lexical stability values of all nodes that are lexically dependent upon the current node to the current node's lexical stability value ('probability density function (pdf)', col. 9, line 14- col. 10, line 23) (claims 9 and 23);

- determining a global stability value by summing lexical stability values of all nodes (*h1+h2+Hrest*, where '*Hrest* is the sum of the heights of the curves for all other clusters' (Gaussians *G1*, *G2* and *G3*), col. 6, lines 10-40; Fig. 5) (claims 10 and 24);

- determining a fractional stability value (or a 'weighting factor' of the membership of a data point *X* to clusters *G1* and *G2*, col. 6, lines 10-40, Fig. 5) for each node based on the aggregate and global stability values (claims 10 and 24);

- displaying the determined fractional stability value for each node (See Fig. 5 with regard to the distance between data point X , X1 and X2; col. 6, lines 17-40)[5] (claims 11 and 25); and

- determining that the fractional stability for a current node comprises dividing the current node's aggregate stability value by the global stability value (Refer to discussion of claims 10 and 24 above; the

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[5] The distances from data point X to the other points X1 and X2 indicate the fractions of X that belong to cluster G1 and cluster G2 (0.8 and 0.2 respectively, as indicated in col. 6, lines 35-40).

weighting factor of h1 to cluster G1 is given by '$h1/ h1+h2+hRest$')

(claims 12 and 26).

It would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify Preston/Can to further include displaying aggregate stability values, determining a global stability value, determining and displaying a fractional stability value for each node, and furthermore determining that the fractional stability for a current node comprises dividing the current node's aggregate stability value by the global stability value, as taught by Fayyad.

The ordinary skilled artisan would have been motivated to modify Preston/Can per the above for the purpose of using probability density to decide how data should be reorganized for efficient nearest neighbor queries (Abstract; col. 3, lines 2-5). Additional motivation would be to a clustered index structure and a statistical model of clustered data in a database in order to determine how data should be partitioned. The model can be used in order that data meets certain 'stability' conditions and that clusters do not overlap. These stability conditions are important because they enable a database design utility to decide whether the indexing method is likely to be useful for a given database (col. 3, lines 6-30).

Conclusion

15.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following reference is cited with respect to measuring of stability of the

clustering or classification of hierarchical data in a database:

'*Techniques for measuring the stability of clustering: a comparative study*',

by Raghavan et al.

16.   Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Cheryl M Fernandes whose telephone

number is (703) 305-3917. The examiner can normally be reached on 9:00 am -

5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Safet Metjahic can be reached on (703) 308-1436. The

fax phone number for the organization where this application or proceeding is

assigned is 703-872-9306.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

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direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free).

WAYNE AMSBURY
PRIMARY PATENT EXAMINER

CMF
June 24, 2004